Accident Sequence Precursor (ASP) Program–Understanding Risk of Operating Events

ASP Background

- The ASP Program is an important part of the NRC's mandate to protect public health and safety. It provides a comprehensive, risk-informed view of nuclear power plant operating experience and a measure for trending core damage risk, provides a partial check on dominant core damage scenarios predicted by probabilistic risk assessments (PRAs), and provides feedback to regulatory activities.

- An ASP is an observed event and/or condition at a plant, when combined with one or more postulated events (e.g., equipment failures, human errors), that could result in core damage.

- Use plant-specific Standardized Plant Analysis Risk (SPAR) model to calculate risk.

- Screening Criteria: $CCDP \geq 10^{-6}$.

ASP Uses

- Input into Performance and Accountability Report to Congress
- Significant Precursors ($CCDP \geq 10^{-3}$) Are a Part of the Abnormal Occurrence Criteria
- Insights on Industry Performance
- Feedback to Improve Risk Models

ASP Process

- All licensee event reports (LERs) are reviewed by the Idaho National Laboratory to determine if they meet the ASP screening acceptance criteria.

- LERs meeting ASP screening acceptance criteria are screened-in and reviewed by the ASP Program Manager to determine if an independent ASP analysis is warranted.

- An independent ASP analysis is not warranted if the event is determined to be a Green finding by the Significance Determination Process (SDP) or if a simplified assessment by a risk analyst, independently confirmed by a second analyst, determines it is not likely a precursor due to low risk to public health and safety.

- Remaining events require a formal quantitative plant-specific SPAR model analysis.

- Events that result in a Conditional Core Damage Probability (CCDP) or an Increase in Core Damage Probability (ΔCDP) below the ASP Program threshold are considered *rejects*, and those above the ASP Program threshold are considered *precursors*.
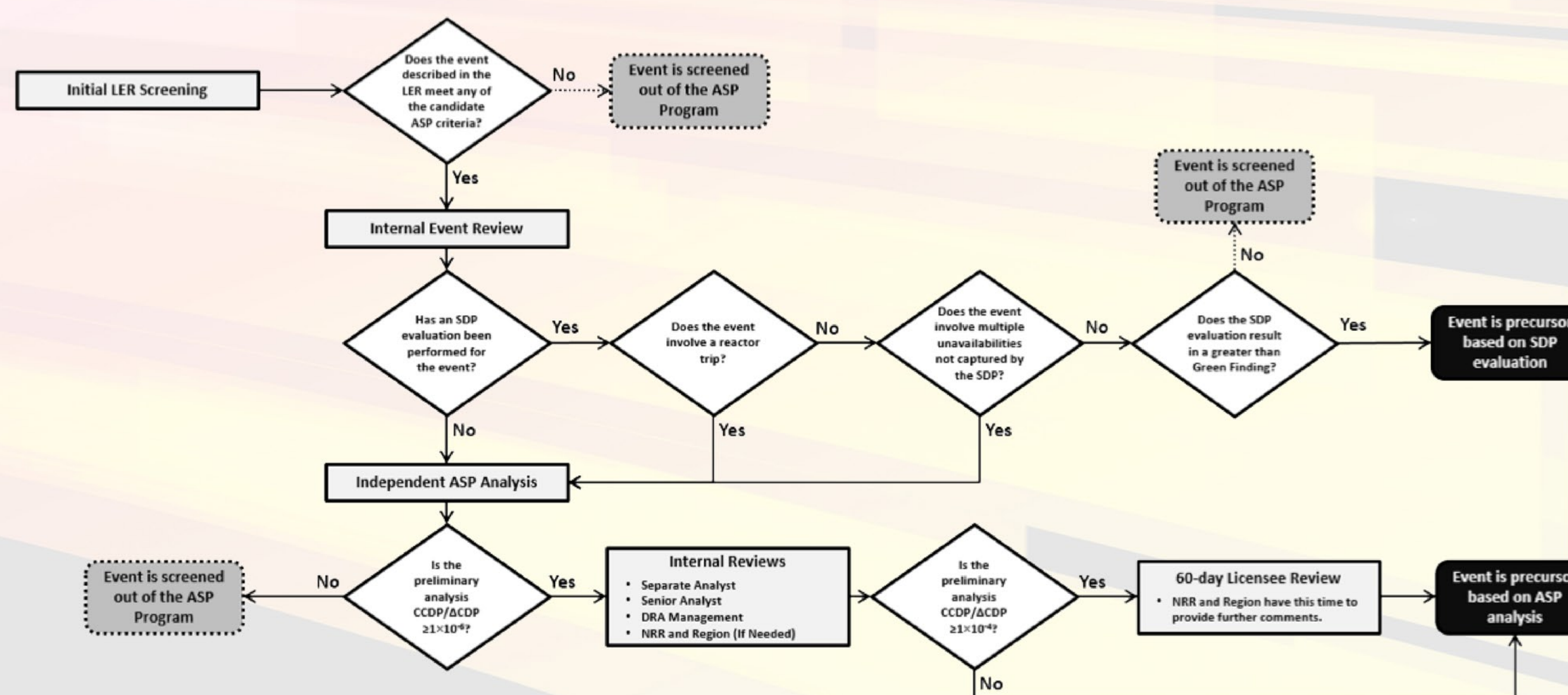
Recent ASP Results
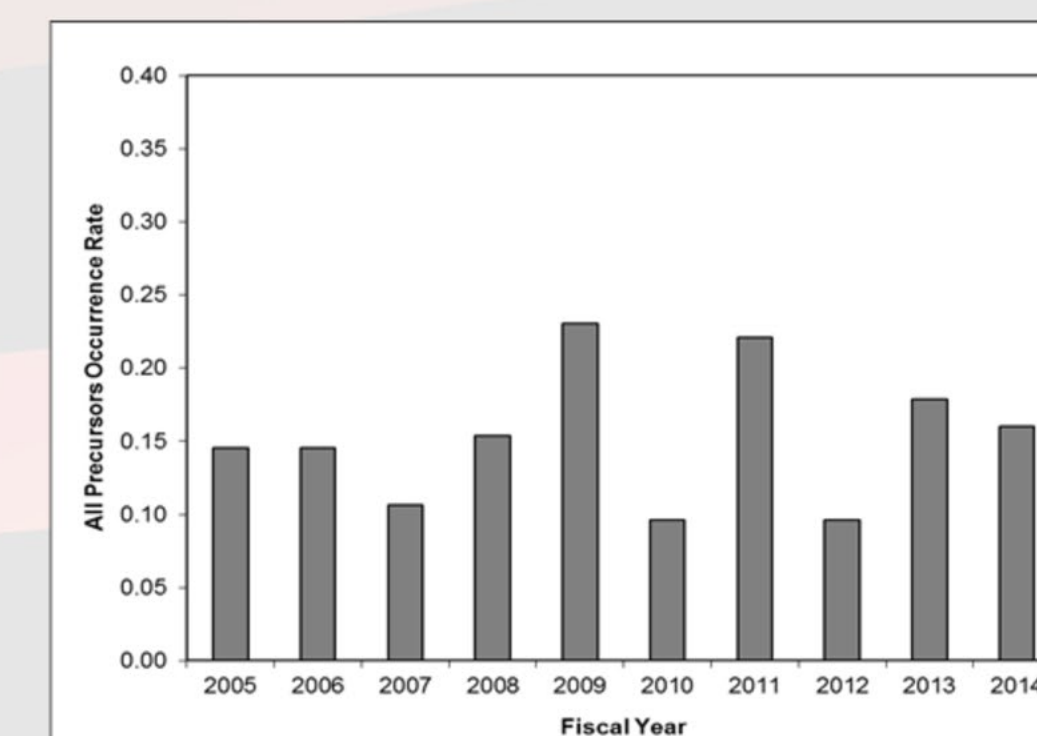
Occurence Rate of All Precursors (No Trend)
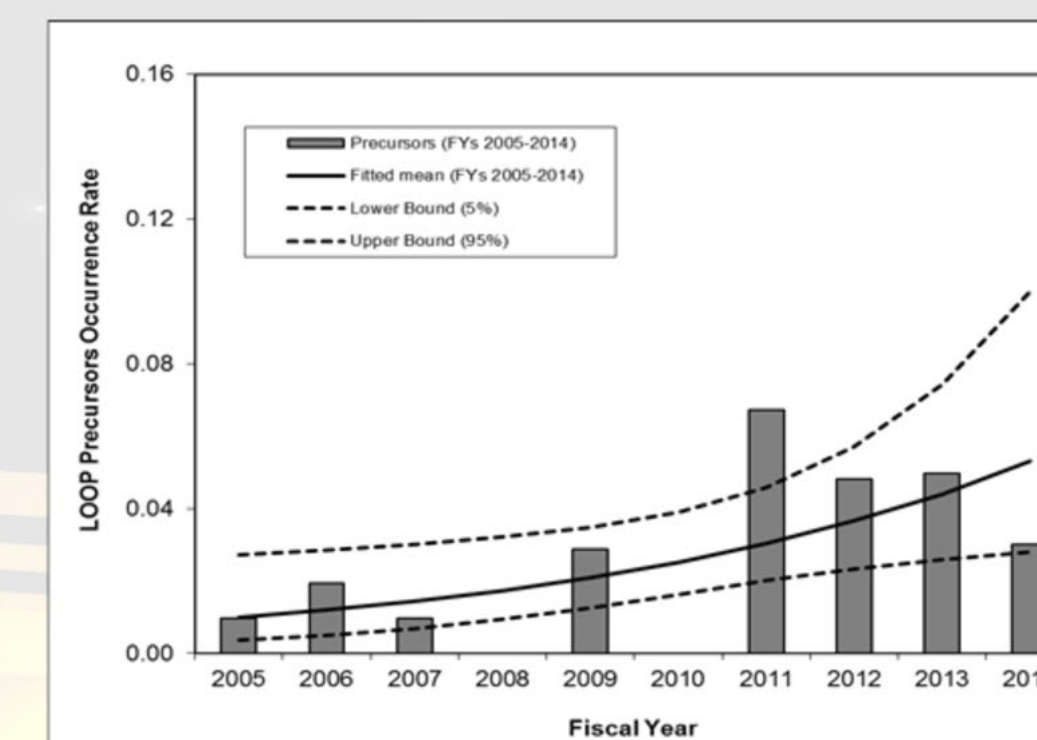
Occurence Rate of Precursors Involving a Complete Loss of Offsite Power (LOOP) (Increasing Trend)

Historical ASP Results

2 ($\geq 10^{-1}$)
5 (10^{-2} to 10^{-1})
26 (10^{-3} to 10^{-2})
177 (10^{-4} to 10^{-3})
281 (10^{-5} to 10^{-4})
365 (10^{-6} to 10^{-5})
66,038 Total Licensee Event Reports Reviewed Through FY 2014